# THE MALE GENITALIA OF BLATTARIA. II. *POECILODERRHIS* SPP. (BLABERIDAE: EPILAMPRINAE).*

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Although the males of most species currently assigned to *Epilampra* lack tergal glands, there are several with dorsal abdominal modifications (Roth, 1969a) which are presumably involved in sexual behavior. The presence or absence of tergal glands and the differences in the genitalia of these two groups of *Epilampra* warrant their being placed in different genera.

## Materials and Methods

The material used in this study were all museum specimens which were softened and had their genitalia removed after slitting the lateral margins of the terminal abdominal segments. The genitalia were treated with 10% KOH, cleared and mounted in Permount. In the illustrations, the hooked right phallomeres are mounted ventral side up, and phallomeres L1 and L2d are mounted dorsal side uppermost.

The source of each of the specimens illustrated is given, using the following abbreviations: (AMNH) = American Museum of Natural History, New York; (ANSP) = Academy of Natural Sciences, Philadelphia; (BMNH) = British Museum (Natural History), London; (L) = Zoological Institute, Lund, Sweden; (MCZ) = Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; (USNM) = United States National Museum, Washington, D.C.

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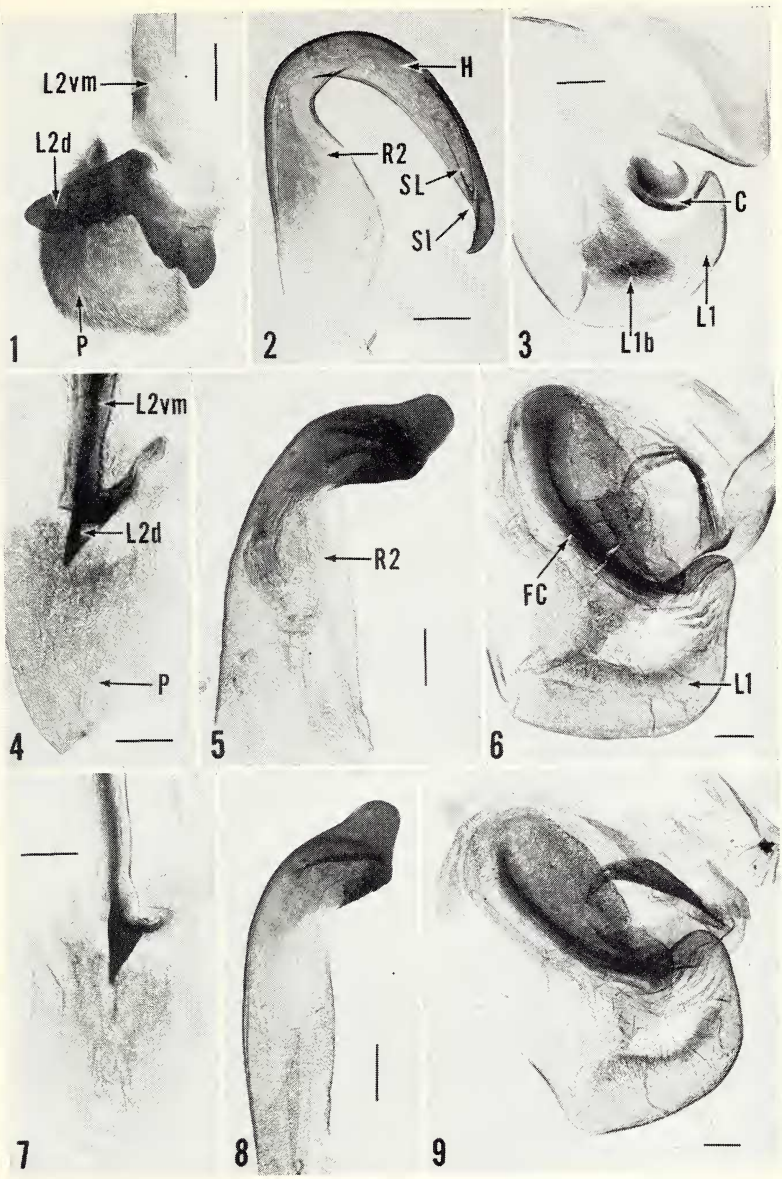
Figs. 1-9. 1-3. *Epilampra maya* Rehn. (158, USNM). Boston Quarantine (det. Roth). 4-9. *Poecilodermis proxima.* 4-6. (22, MCZ). Brazil (det. Roth). 7-9. (20, BMNH). Brazil, Rio de Janeiro, Itatiaya (det. Roth). AL = accessory lobe; H = hook; L1 = first sclerite of left phallomere; L1b = setal brush of L1; L2vm = median sclerite (L2 ventromedial); L2d = dorsal sclerite of L2; P = prepuce; R2 = hooked sclerite of right phallomere; C = cleft of L1; FC = fused cleft of L1; SI = subapical incision of R2; SL = subapical lobe. (scale = 0.2 mm).


L2vm
L2d
P
1
H
R2
SL
Sl
2
C
L1
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3
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4
R2
5
FC
L1
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7
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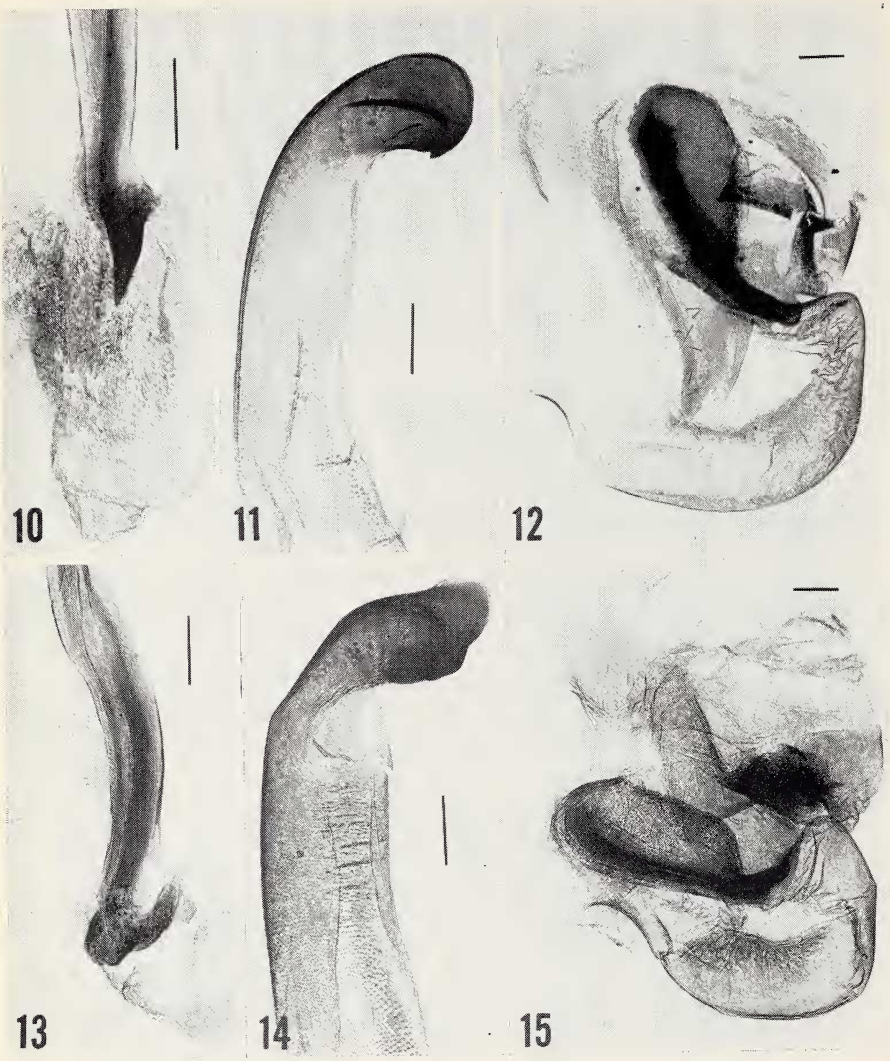
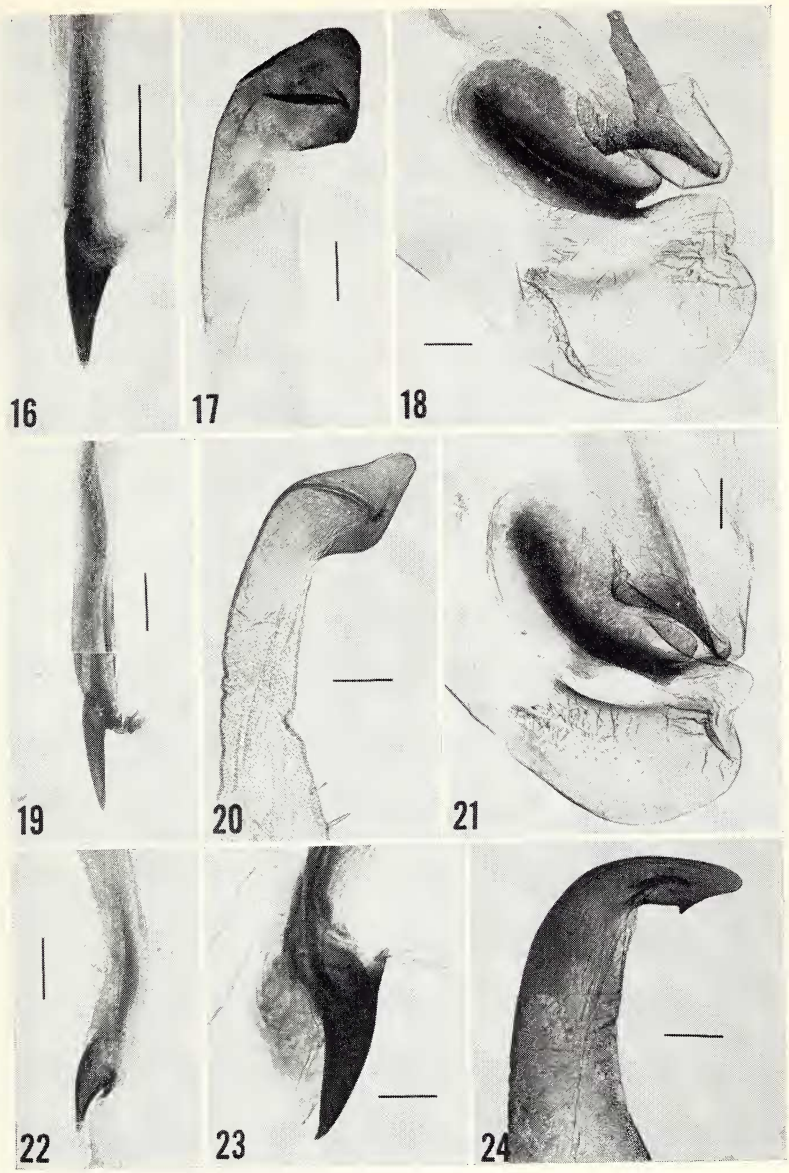
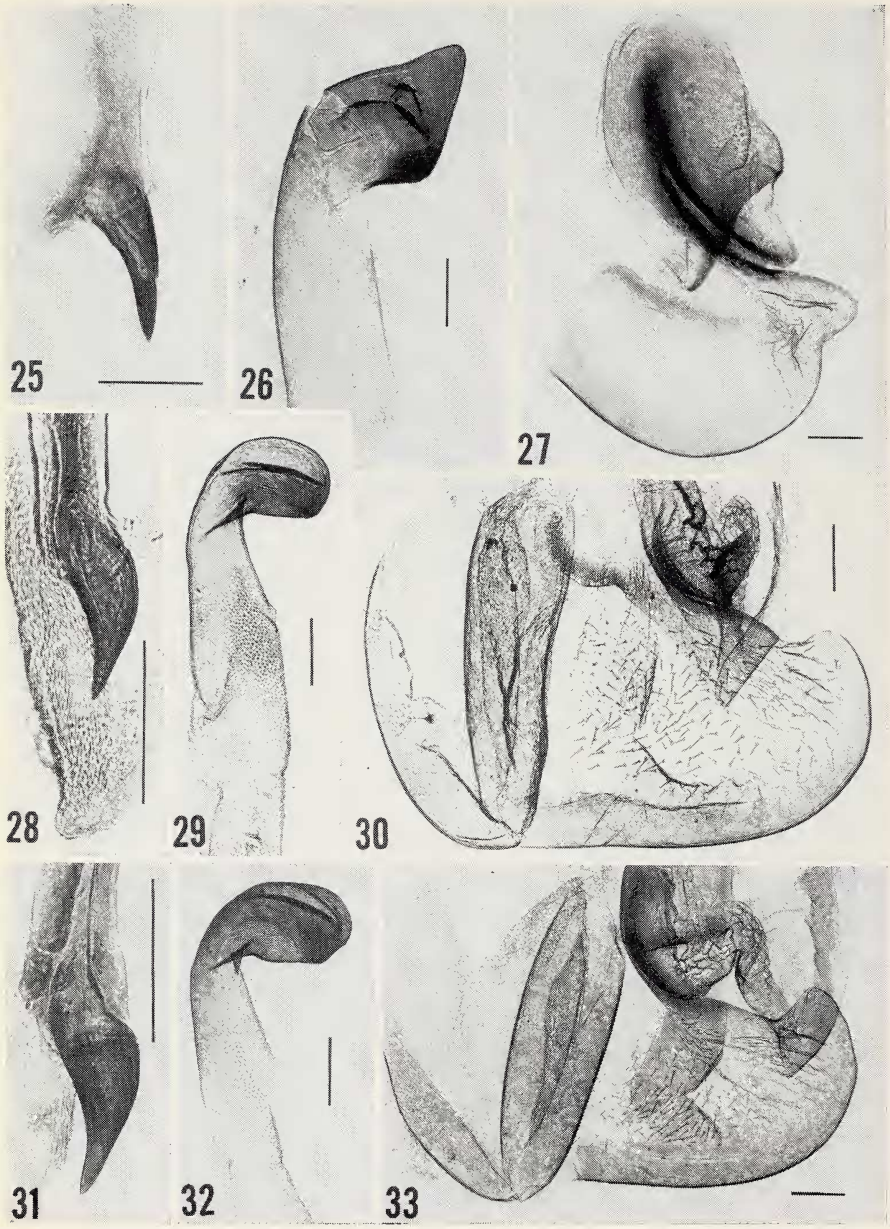


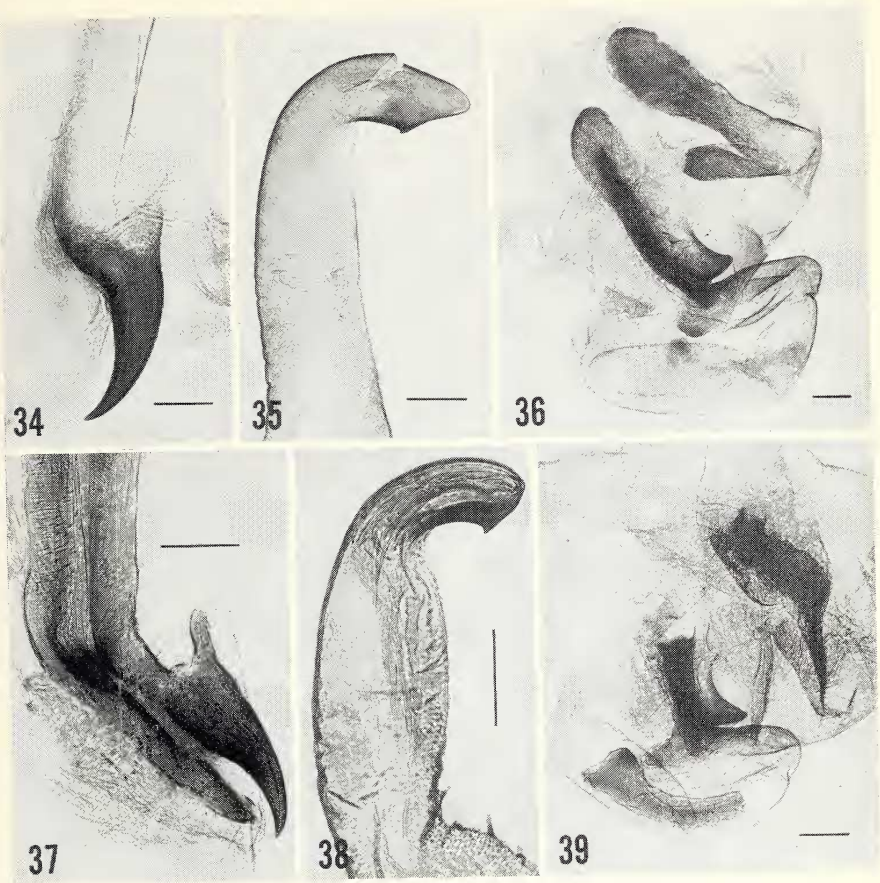

Figs. 10-15. *Poeciloderrhis* spp. 10-12. (1501, L). *P. proxima*. Ornsköldsvik, Sweden; tergal glands in Figs. 48, 49. (Adventive) (det. Princis). 13-15. (58, USNM). *P. verticalis*. Serra Caraça, Matto Grosso, Brazil; adult and tergal glands in Figs. 50-52. (det. Gurney). (The tip of L2d was inadvertantly cut off.) (scale = 0.2 mm).




Figs. 16-24. *Poeciloderrhis* spp. 16-22. *P. ferruginea*. 16-18. (110, ANSP. São Paulo, Brazil (det. Roth). 19-21. (31, AMNH). Corupa, Hansa Humbolt, St. Catharina, Brazil. (det. Roth). 22. (167, USNM). St. Catharina, Nova Teutonia, Brazil (det. Roth). 23-24. (45, ANSP). *P. atriventris*. (det. Hebard). (scale = 0.2 mm).




Figs. 25-33. *Poeciloderrhis* spp. 25-27. (12, BMNH). *P. ferruginea.* Rio de Janeiro, Organ Mts. near Tijuca, Brazil. (det. Princis). 28-33. *Poeciloderrhis* sp. *A.* 28-30. (72, MCZ). Annapolis, Goias, Brazil; tergal gland in Fig. 40. (det. Roth). 31-33. (109, ANSP). "Vlannopolis", Goias, Brazil. (det. Roth). (scale = 0.2 mm).




Figs. 34-39. *Poeciloderrhis* spp. 34-36. (9, BMNH). *P. atriventris;* tergal glands in Figs. 43-44. (det. Hebard). 37-39. (183, USNM). *P. catharina.* (Type of *Audrcia catharina* Shelford. St. Catharina, Brazil; adult in Figs. 41-42.) (scale = 0.2 mm).

Geographical collection data, and the specialists who identified the specimens, if known, follow these abbreviations. The number preceding the abbreviations refers to the number assigned the specimen and its corresponding genitalia (on a slide) which were deposited in the museums indicated.

## Results and Discussion

In a previous paper on *Epilampra*, Roth and Gurney (1969) followed McKittrick's (1964) terminology. In her figure 128 (p. 180) of the male genitalia of *Epilampra azteca* Saussure there are 2 structures below L2vm (median sclerite of left phallomere) one of which she labeled L2d (dorsal sclerite of left phallomere). In most *Epilampra* there is a sclerotized plate which lies at the base of L2vm (but separated from it by a thin membrane) (Fig. 1) and Roth and Gurney (1969) named this structure L2bp (basal plate of L2). However, I have studied the male genitalia of a large number of Blaberidae and believe that L2bp is actually L2d and what we and McKittrick (1964) called L2d in *Epilampra* is in reality a modified prepuce. In *Blaberus* (Princis, 1946; Roth, 1969b) and other Blaberinae (Roth, unpublished observations) the prepuce has characteristic spines associated with it and partly surrounds the virga (L2d) (See Fig. 121 *in* McKittrick 1964).

Stål (1874) without mentioning any species proposed the name *Poeciloderrhis* for American *Epilampra* and separated them from the genus *Epilampra* (which he considered Asiatic-Australian) on the differences of front femoral spines. Kirby (1903) split the old genus *Epilampra*, proposing *Heterolampra* for an Australian species, retained Burmeister's *Epilampra* for American species with *E. brasiliensis* (Fab.) as type species, and selected *E. verticalis* Burm. (a species of Brazil and Argentina) as the type of *Poeciloderrhis* Stål. In his 1904 catalogue Kirby listed *Poeciloderrhis* as valid, with *verticalis* as type; he also included under this genus, *proxima* Brunner, *bivittata* Saussure, and *maculifrons* Stål. In the Genera Insectorum fascicle on Epilamprinae, Shelford (1910) listed *Poeciloderrhis* as a synonym of *Epilampra*, as does Princis (1967a) in his catalogue.

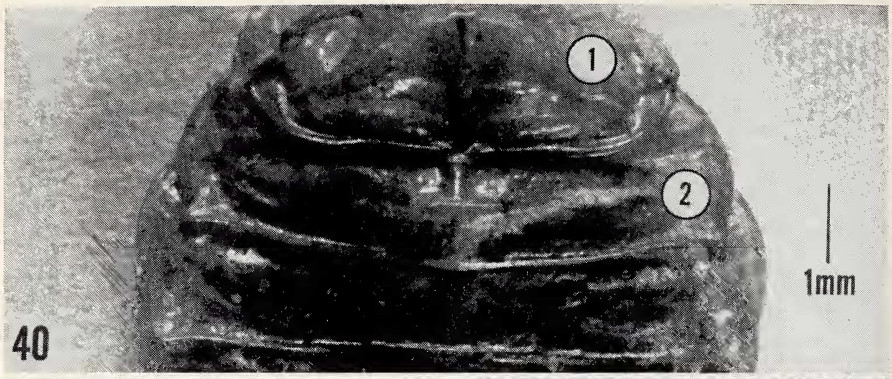
The species of *Epilampra* in which males have tergal glands have markedly different genitalia than the species which lack these modifications. *Epilampra verticalis* Burmeister has tergal glands on segments 1 and 2 and since this species is the type of *Poeciloderrhis* I use this generic name to represent tergal modified species of *Epilampra*.

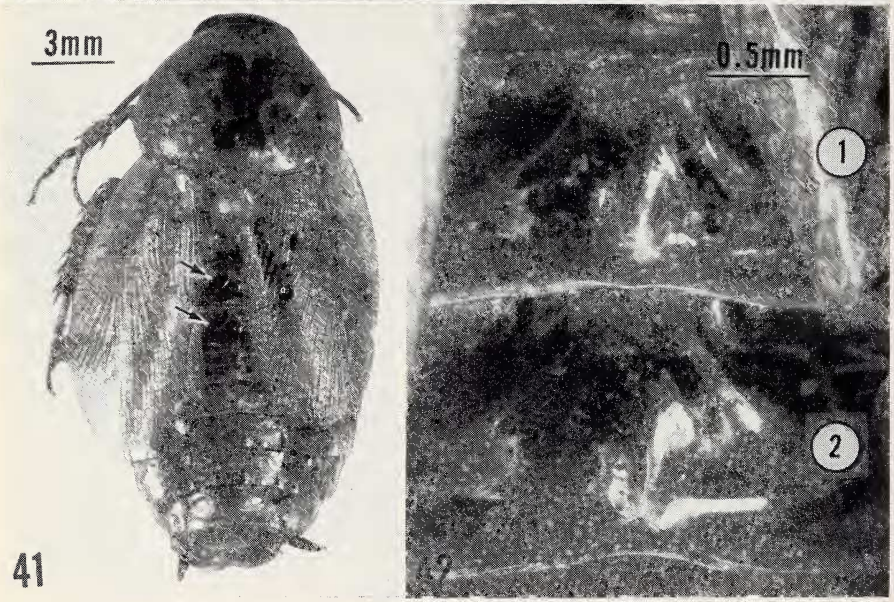
The male genitalia of species of *Epilampra* (lacking tergal glands) consist of 3 principal phallomeres (Roth and Gurney, 1969) which may vary sufficiently in shape to distinguish species and species groups (Roth, 1970). All 3 phallomeres of *Epilampra* differ basically from *Poeciloderrhis* (cf. Figs. 1-3 and 4-6). The two genera may be separated in the following key:

1. Males without tergal modifications on segments 1 and 2. L2d and L2vm separated from each other, and the prepuce usually distinctly outlined and setose (Fig. 1). Hooked portion of R2 usually relatively slender and tapering (sometimes broadened in the middle by a flange), with a subapical incision, and subapical lobe (Fig. 2). L1 with or without a setal brush (Fig. 3), and cleft not fused together. ..... *Epilampra* spp.
2. Males with tergal glands on abdominal segments 1 and 2 only. L2d pointed and fused solidly to L2vm; prepuce membranous, not clearly defined by dense setae (Figs. 4, 7, 10, 13, 16, 19, 22, 23, 25, 28, 31, 34, 37). R2 short and stout, without apical incision (Figs. 5, 8, 11, 14, 17, 20, 24, 26, 29, 32, 35, 38). L1 without a setal brush and the sclerotized cleft fused together (Figs. 6, 9, 12, 15, 18, 21, 27, 30, 33, 36, 39). ..... ..... *Poeciloderrhis* spp.

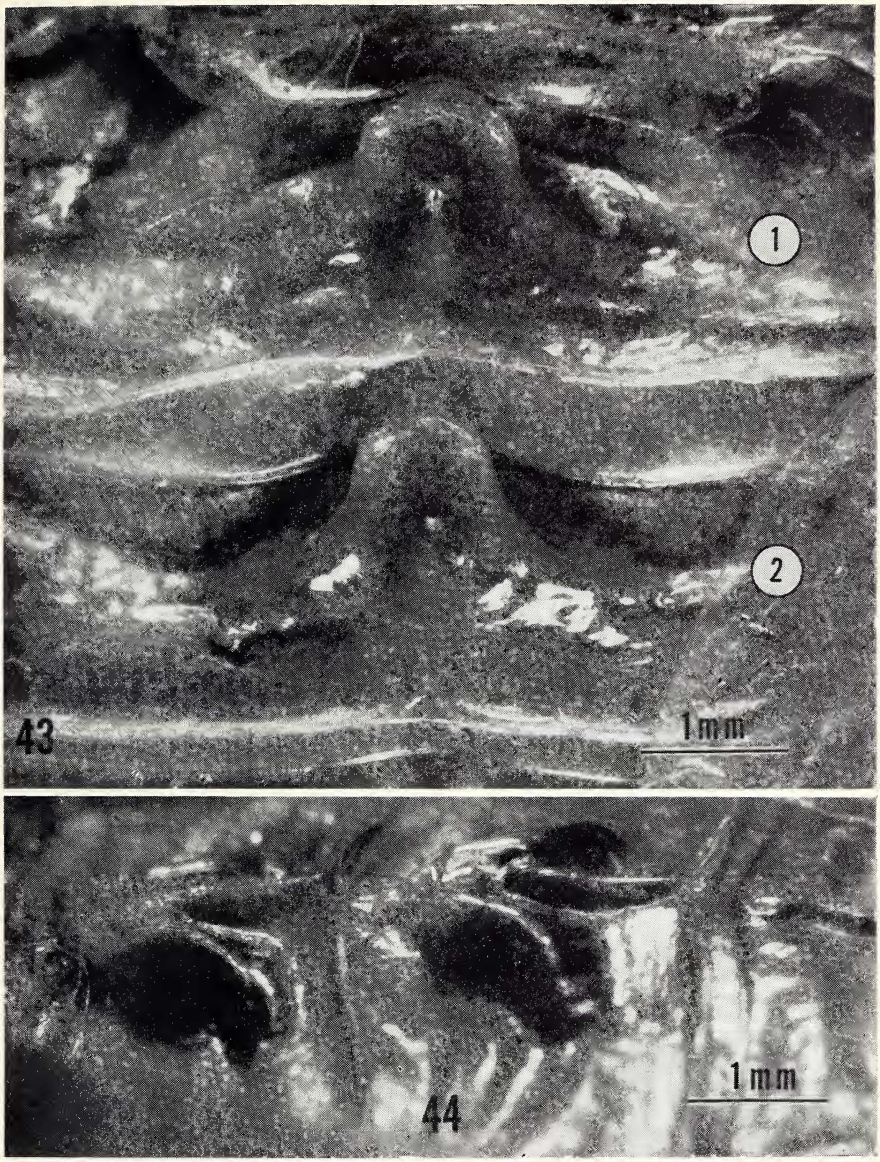
The tergal glands on segments one and two of *Poeciloderrhis* show greater differences between species than do their genitalia and the following key characters may be used to distinguish the forms discussed in this paper:

1. Glands without sclerotized horns or deep depressions on either segments one and two. Segment 1 with a low median ridge flanked on each side by raised mounds bearing setae. Segment 2 with a transverse elevation bearing setae; medially, a small vertical ridge anterior to the elevation (Fig. 40). ..... sp. *A*.
   Modifications include medial knobs on segments 1 and 2, or a sclerotized horn on segment 2 only. ..... 2.
2. Broad, anteriorly rounded, relatively flat medial knobs on segments 1 and 2. ..... *catharina* (Shelford) (Figs. 41, 42). *atriventris* (Saussure) (Figs. 43-44).
   Segment 2 with a black sclerotized horn arising from a deep depression. ..... 3.
3. Deep sclerotized pit behind the black horn on segment 2; horn relatively short and stout. Segment 1 with a well defined medial mound, bearing fine short setae (Figs. 45-46). ..... ..... *ferruginea* (Brunner).

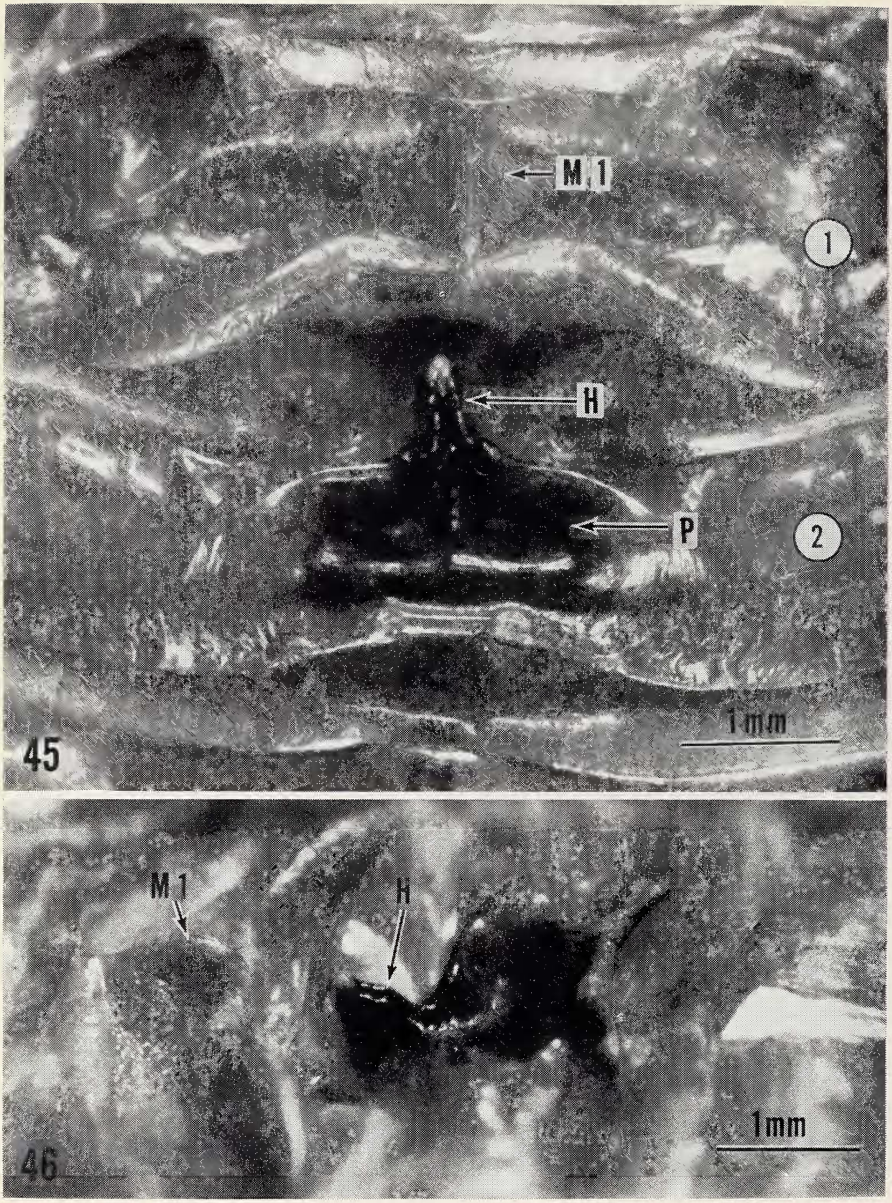


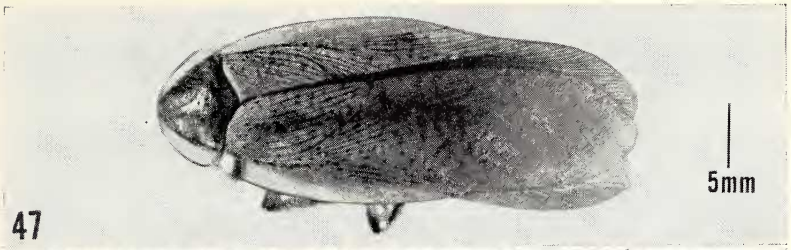

Figs. 40-42. *Poeciloderrhis* spp. 40. (72, MCZ). *Poeciloderrhis* sp. *A*. Tergal modifications on segments 1 and 2 (circled numbers). Annapolis, Goias, Brazil (det. Roth). (genitalia in Figs. 28-30). 41-42. (183, USNM). *P. catharina*. The tergal glands are indicated by arrows (Fig. 41) and circled numerals (Fig. 42). (Type of *Audrcia catharina* Shelford, St. Catharina, Brazil; genitalia in Figs. 37-39).

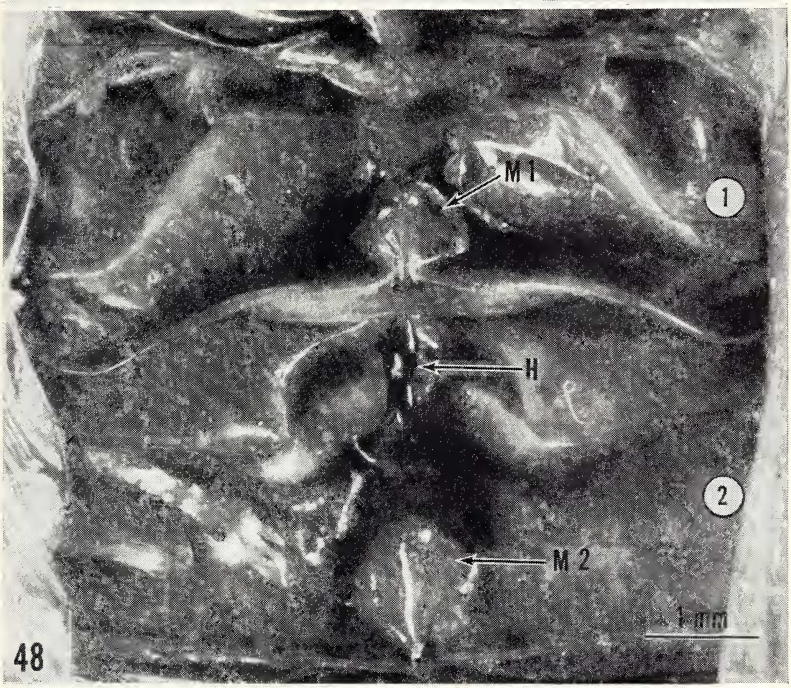


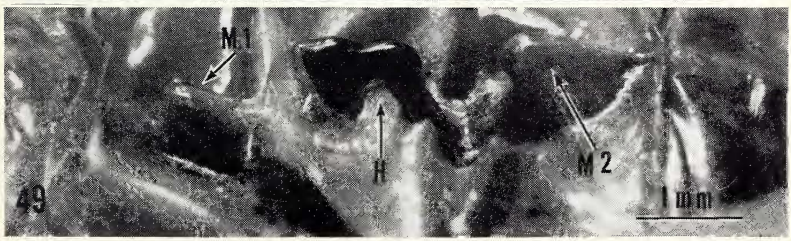

Figs. 43-44. *Poeciloderrhis atriventris.* Tergal glands on segments 1 and 2 (circled numbers). (9, BMNH). Dorsal (Fig. 43) and lateral (Fig. 44) views; genitalia in Figs. 34-36). (det. Hebard).



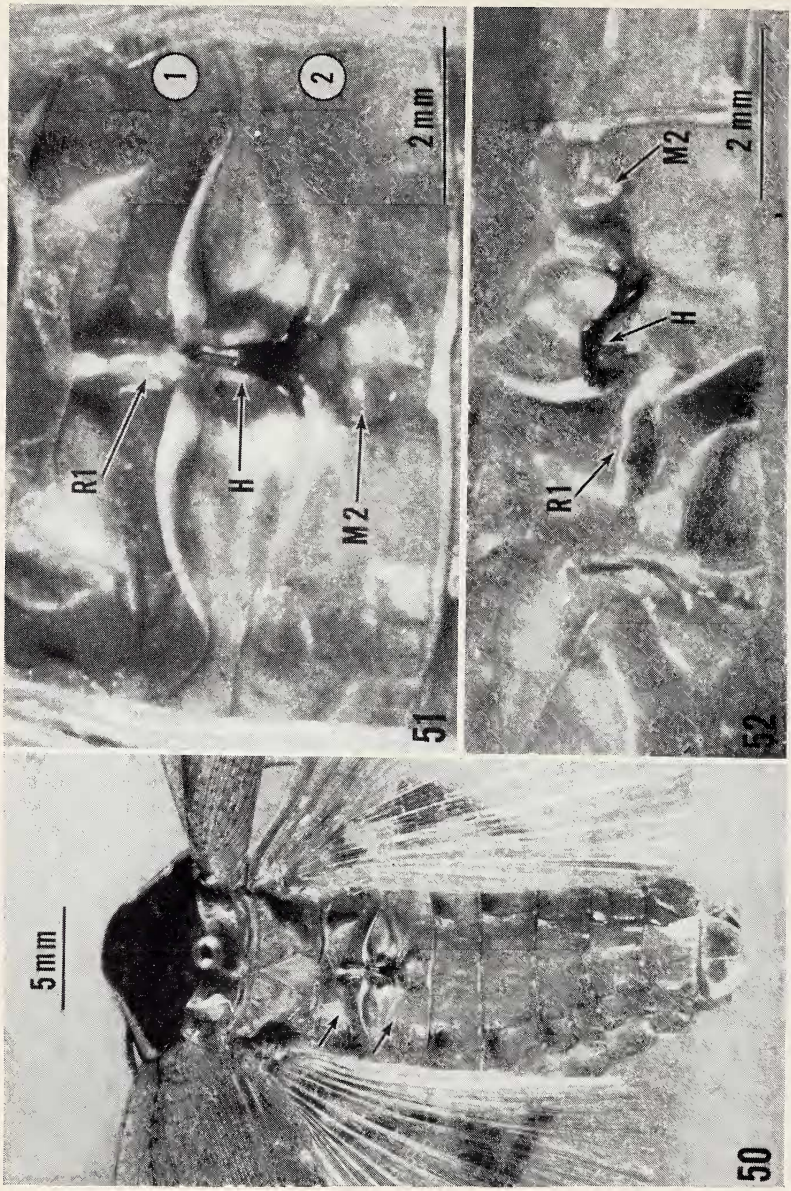

Figs. 45-46. *Poeciloderrh's ferruginea.* Tergal glands on segments 1 and 2 (circled numbers). (166, USNM). St. Catharina, Nova Teutonia, Brazil. Dorsal (Fig. 45) and lateral (Fig. 46) views. (det. Roth). M1 = pyramidal shaped, setose mound on segment 1; H = sclerotized horn on segment 2; P = pit.




Figs. 47-49. *Poeciloderrhis proxima*. 47. (22, MCZ). Brazil. (det. Roth). 48-49. (1501, L). Tergal glands on segments 1 and 2 (circled numbers). Ornsköldsvik, Sweden (adventive). Dorsal (Fig. 48) and lateral (Fig. 49) views; genitalia in Figs. 10-12. (det. Princis). M1 = pyramidal shaped mound on segment 1; H = sclerotized horn on segment 2; M2 = pyramidal shaped mound on segment 2.


5mm
50
R1
H
M2
1
2
2mm
51
R1
H
M2
2 mm
52

Pyramidal shaped elevation on segment 2, behind a slender horn, which is elongate, hook shaped, directed anteriorly, and reaches the posterior margin of segment 1. ..... 4.

4. Anterior margin of segment 2 roundly indented, semicircular in outline. Medial moundlike elevation on segment 1 similar in shape though smaller than the one found behind the horn on segment 2 (Figs. 48-49). ..... *proxima* (Brunner).

Anterior margin of segment 2 not as deeply excavated nor as clearly semicircular in outline. Raised medial ridge on segment 1 not pyramidal in shape but more or less uniform in height for its entire length (Figs. 50-52). .... *verticalis* (Burmeister).

The subgenital plates of *Poeciloderrhis* males are highly asymmetrical and more or less similar in shape (see Fig. 8, *in* Princis, 1967b). *Epilampra cribrosa* Burm. has tergites 1 and 2 modified (Princis, 1967b) and therefore is a *Poeciloderrhis*.

The status of the genus *Audreia* Shelford has been questionable and was based principally on a reduction in wings and tegmina in both sexes. It will be reported on elsewhere. The genitalia of *Audreia catharina* Shelford are obviously typical of species of "*Epilampra*" which have tergal glands and I therefore place it in the genus *Poeciloderrhis*. The tergal glands and genitalia of *catharina* are closer to *atriventris* than they are to the other species of the genus.

There may be some question as to the identity of *verticalis* and *proxima*. These are species which have lateral pale markings of the pronotum (Figs. 47, 50). The genitalia of *proxima* shown in Figs. 4-6, came from a specimen (Fig. 47) determined by Rehn as *verticalis*; however, its tergal gland was similar to the specimen determined by Princis as *proxima* (Figs. 48, 49). I have seen a third species belonging to this complex (pale, lateral pronotal coloration) whose tergal glands differed from the species here considered to be *proxima* and *verticalis*. In the final analysis, only type males can solve questions of identity in these similar appearing species.

*Epilampra* is in the tribe Epilamprini (McKittrick, 1964). Because of the morphologic (tergal glands, subgenital plate) and genitalic differences between *Epilampra* and *Poeciloderrhis* I suggest that the latter genus be assigned to the Poeciloderrhini.

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Figs. 50-52. *Poeciloderrhis verticalis*. (58, USNM). Serra Caraça, Matto Grosso, Brazil; genitalia in Figs. 13-15. The tergal glands are indicated by arrows (Fig. 50), and circled numbers (Fig. 51, dorsal). Fig. 52 is a lateral view. (det. Gurney). R1 = medial ridge on segment 1; H = sclerotized horn on segment 2; M2 = pyramidal shaped horn on segment 2.

## Summary

Based on differences in male genitalia, and the presence or absence of tergal glands, species of *Epilampra* are divided into 2 genera. Species in which the males have tergal glands on segments 1 and 2 are placed in the genus *Poeciloderrhis* Stål. Species with males lacking glandular modifications on the tergites are restricted to the genus *Epilampra* Burmeister. *Poeciloderrhis* is placed in the tribe Poeciloderrhini.

## Acknowledgements

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